

We claim:

- 1 1. A method of providing a link-redial service comprising:
  - 2 receiving a request to set up a label switched path segment over a direct
  - 3 connection between a head end node and a tail end node, said request
  - 4 specifying a required protection bandwidth for said label switched path
  - 5 segment;
  - 6 determining a backup route to said tail end node, responsive to said receiving,
  - 7 where said backup route avoids use of said direct connection between said
  - 8 head end node and said tail end node;
  - 9 signaling to reserve said required protection bandwidth along said backup
  - 10 route;
  - 11 receiving confirmation of reservation of said required protection bandwidth;
  - 12 and
  - 13 generating a backup connection map, where said backup connection map
  - 14 associates a label related to said label switched path segment with an initial
  - 15 link in said backup route.
- 1 2. The method of claim 1 further comprising:
  - 2 responsive to said receiving said request, signaling to establish said label
  - 3 switched path segment over said direct connection;
  - 4 generating a working connection map, where said working connection map
  - 5 associates a label related to said label switched path segment with said direct
  - 6 connection; and
  - 7 switching incoming traffic according to said working connection map.
- 1 3. The method of claim 2 further comprising:
  - 2 receiving a link failure notification for said direct connection; and

responsive to said receiving said link failure notification, switching incoming traffic according to said backup connection map.

4. The method of claim 3 further comprising:

before said switching incoming traffic according to said backup connection map, selecting a backup bundle, where a backup bundle is a logical association of backup label switched paths that follow a single predetermined route to said tail end node;

determining whether protection bandwidth is in use on said selected backup bundle; and

where said protection bandwidth is not in use on said selected backup bundle, activating a backup connection map corresponding to use of said backup bundle.

5. The method of claim 4 further comprising, where said protection bandwidth is not in use on said selected backup bundle, marking said protection bandwidth as being used.

6. The method of claim 5 wherein said marking includes an identification of said selected backup bundle.

7. The method of claim 5 wherein said marking includes an indication of a priority of traffic associated with said backup bundle.

8. A head end node in a mesh network comprising:

a plurality of input ports;

a plurality of output ports;

a connection processor adapted to connect selected ones of said plurality of input ports to selected ones of said plurality of output ports according to a working connection map, said connection processor operable to:

7 receive a request to set up a label switched path segment over a direct  
8 connection between said head end node and a tail end node, said  
9 request specifying a required protection bandwidth for said label  
10 switched path segment;

11 determine a backup route to said tail end node, responsive to said  
12 receiving, where said backup route avoids use of said direct connection  
13 between said head end node and said tail end node;

14 signal to reserve said required protection bandwidth along said backup  
15 route;

16 receive confirmation of reservation of said required protection  
17 bandwidth; and

18 generate a backup connection map, where said backup connection  
19 map associates a label related to said label switched path segment  
20 with an initial link in said backup route.

1 9. A head end node in a mesh network comprising:

2 means for receiving a request to set up a label switched path segment over a  
3 direct connection between a head end node and a tail end node, said request  
4 specifying a required protection bandwidth for said label switched path  
5 segment;

6 means for determining a backup route to said tail end node, responsive to  
7 said receiving, where said backup route avoids use of said direct connection  
8 between said head end node and said tail end node;

9 means for signaling to reserve said required protection bandwidth along said  
10 backup route;

11 means for receiving confirmation of reservation of said required protection  
12 bandwidth; and

13 means for generating a backup connection map, where said backup  
14 connection map associates a label related to said label switched path  
15 segment with an initial link in said backup route.

1 10. A computer readable medium containing computer-executable instructions which,  
2 when performed by a connection processor in a head end node in a communications  
3 network, cause the connection processor to:

4 receive a request to set up a label switched path segment over a direct  
5 connection between said head end node and a tail end node, said request  
6 specifying a required protection bandwidth for said label switched path  
7 segment;

8 determine a backup route to said tail end node, responsive to said receiving,  
9 where said backup route avoids use of said direct connection between said  
10 head end node and said tail end node;

11 signal to reserve said required protection bandwidth along said backup route;

12 receive confirmation of reservation of said required protection bandwidth; and

13 generate a backup connection map, where said backup connection map  
14 associates a label related to said label switched path segment with an initial  
15 link in said backup route.